

REMARKS

Claims 1-16 are pending in this application. By this Amendment, claims 1, 2, 5-7 and 10 are amended. Claims 1, 2 and 6 are amended to more clearly set forth the subject matter claimed therein. Support for the amendments to claims 1, 2 and 6 can be found in claims 1, 2 and 6 as originally filed, respectfully, and in the specification as originally filed, for example, at paragraph [0058]. Claim 5 is amended into independent form, including all of the limitations of the base and intervening claims; support for the amendments to claim 5 can be found in claims 1, 4 and 5 as originally filed. Claim 10 is amended to include a step of calculating allowable fluctuation of total pressure for each component; claim 11 is amended merely to prevent ambiguity from arising due to the amendment of claim 10. Support for these amendments can be found in the specification as originally filed, for example, at paragraph [0048] and in claim 5 as originally filed. Thus, no new matter is added by these amendments.

I. Objections to the Claims

Applicants thank the Examiner for the indication that claims 5, 12 and 16 contain allowable subject matter and would be allowable if rewritten in independent form including all of the limitations of the base claim and intervening claims. Because claim 5 has been rewritten in independent form including all of the limitations of the base and intervening claims, claim 5 is in condition for allowance. In addition, because the rejections of the base and intervening claims are overcome for the reasons described below, claims 12 and 16 are also in condition for allowance.

II. Rejections of the Claims

A. Mitsui in view of Holkeboer

The Office Action rejects claims 1-4, 6, 8, 9, 13 and 14 under 35 U.S.C. §103(a) over U.S. Patent 4,948,962 to Mitsui et al. in view of U.S. Patent 5,889,281 to Holkeboer et al. Applicants respectfully traverse this rejection.

Independent claim 1 sets forth, in pertinent part, a "method of ion attachment mass spectrometry ... comprising: a step of utilizing a property that sensitivity of each component of said gas has dependency on a total pressure of said reduced pressure atmosphere and that said dependency on the total pressure differs for each component, ... wherein the total pressure of said reduced pressure atmosphere is set and maintained in a range from about 50 Pa to about 250 Pa." Independent claim 2 sets forth a similar method, "comprising: a step of utilizing a property that sensitivity of each component of said gas has dependency on a total pressure of said reduced pressure atmosphere and that said dependency on the total pressure differs for each component, ... wherein the total pressure of said reduced pressure atmosphere is set and maintained in a range from about 50 Pa to about 250 Pa." Independent claim 6 sets forth an "apparatus for ion attachment mass spectrometry for measurement of mass spectrometry provided with: a reaction chamber ... ; a mass spectrometer ... ; an analysis chamber ... ; an introduction mechanism ... ; an evacuation mechanism ... ; a data processor ... ; wherein the measurement of mass spectrometry on said gas to be detected is performed after causing the positively charged metal ions to attach to said gas to be detected to ionize it through said reaction chamber and analysis chamber with a reduced pressure atmosphere; ... and wherein the total pressure of said reduced pressure atmosphere is set and maintained in a range from about 50 Pa to about 250 Pa." Claims 3, 4, 8, 9, 13 and 14 are dependent, directly or indirectly, upon claims 1, 2 or 6.

Mitsui describes a "sample introduced into plasma is ionized with plasma in plasma ion source mass spectrometer." Mitsui, col. 2, lines 64-65. That is, Mitsui relates to mass spectrometry in which the sample is ionized with a plasma ion source.

While Applicants do not necessarily agree with the characterization of Mitsui or Applicants' prior arguments as set forth in the Office Action, Applicants respectfully submit that, regardless of the actual teachings of Mitsui, Mitsui does not disclose, teach or suggest either a method of ion attachment mass spectrometry or an apparatus for ion attachment mass spectrometry in which the total pressure of a reduced pressure atmosphere is set and maintained in the range from about 50 Pa to about 250 Pa. Accordingly, Mitsui alone could not have rendered claims 1-4, 6, 8, 9, 13 and 14 obvious. Combining Mitsui with Holkeboer does not remedy the shortcomings of Mitsui.

Holkeboer teaches quadrupole mass spectrometry, and specifically the method for linearizing the sensitivity of the ion current. Holkeboer teaches that the sample for quadrupole mass spectrometry is ionized using electrons from an electron emitter.

While Applicants do not necessarily agree with the characterization of Holkeboer or Applicants' prior arguments as set forth in the Office Action, Applicants respectfully submit that, regardless of the actual teachings of Holkeboer, Holkeboer does not disclose, teach or suggest either a method of ion attachment mass spectrometry or an apparatus for ion attachment mass spectrometry in which the total pressure of a reduced pressure atmosphere is set and maintained in the range from about 50 Pa to about 250 Pa.

Specifically, Holkeboer teaches enlarging the pressure range in which the linearity relationship between the pressure and the ion current is kept by correcting the actually measured ion current value. See, *e.g.*, Holkeboer, col. 1, line 53 - col. 2, line 2. However, Holkeboer only discloses the effectiveness of this method under a total pressure range of less than about 0.01 Torr, which is about 1.33 Pa. See Holkeboer, Fig. 5-9. Holkeboer does not

disclose, teach or suggest that such a method could be carried out or would be useful at higher total pressures, such as those set forth in claims 1, 2 and 6.

Claims 1-4, 6, 8, 9, 13 and 14 are patentable over Mitsui and Holkeboer, individually or in combination, at least because neither reference teaches or suggests a method of ion attachment mass spectrometry comprising: a step of utilizing a property that sensitivity of each component of said gas has dependency on a total pressure of said reduced pressure atmosphere and that said dependency on the total pressure differs for each component, in which the total pressure of said reduced pressure atmosphere is set and maintained in the range from about 50 Pa to about 250 Pa. Nor do the references teach or suggest an apparatus for ion attachment mass spectrometry for measurement of mass spectrometry in which the measurement is performed after causing positively charged metal ions to attach to a gas to be detected to ionize it through a reaction chamber and an analysis chamber with a reduced pressure atmosphere; and in which the total pressure of said reduced pressure atmosphere is set and maintained in the range from about 50 Pa to about 250 Pa. Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

B. Mitsui in view of Mowry

The Office Action rejects claims 7, 10, 11 and 15 under 35 U.S.C. §103(a) over U.S. Patent 4,948,962 to Mitsui et al. in view of U.S. Patent 5,962,774 to Mowry et al. By this Amendment, claim 7 has been amended to include the step of calculating the allowable fluctuation of total pressure for each component using a rate of change of sensitivity corresponding to the total pressure during the measurement and a required quantitative error value, as set forth in non-rejected claim 5. For at least the same reasons claim 5 is patentable, Applicant respectfully submits that claims 7, 10, 11 and 15 are also patentable over Mitsui and Mowry. Accordingly, reconsideration and withdrawal of this rejection is respectfully requested.

III. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-16 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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